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ABSTRACT

The profiles provided list advantages, disadvantages, and suggestions for use of 12 basic types of audiovisual materials and equipment. In some instances, points to remember about construction purposes and methods of utilization are included. Formats described are charts, graphs, and maps: filmstrips and slides; super 8mm film loop projections: motion pictures (16mm): records and record players; microforms; overhead projector and transparencies; opaque projector; tape recorder; television; still cameras (box or 35mm); and videotape recorder. Uses of copy machines in the preparation of instructional materials are outlined, and a biblicgraphy is attached. (SW)

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HANDBOOK FOR USE OF BASIC NONBOOK MATERIALS

by

John D. Magaro

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INTRODUCTION

This Handbook on the subject of nonbook materials is intended to be definitive and descriptive and hopefully currently complete. Much has been written about "nonbook materials" and "newer media." There has been much viewing with hope, as well as viewing with alarm. To date, however, there exists no comprehensive handbook describing the advantages, disadvantages and suggestions for use of basic audiovisual materials and equipment, both new and old, with comparison of their characteristics and an analysis of the various alternatives for the media user to consider. An attempt has been made to provide such a classified listing.

Nonbook materials have frequently been confused in many people's thinking with audiovisual aids, particularly in instruction. This is because they have traditionally been administered by school audiovisual people along with various other kinds of learning resources and instructional aids for the classroom teacher. Basically an aid merely supports a teacher's presentation whereas nonprint materials or a communication medium is self-supporting.

Each of the nonbook materials which have been identified and listed will be described in terms of advantages, disadvantages, and in some instances points to remember about construction purposes and methods of utilization.

CHARTS, GRAPHS, AND MAPS

Advantages

1. Aid students in finding their way.
2. Represent in graphic form what otherwise would require much writing.
3. Can be used in many ways.
4. Transform abstract descriptions into visual images.
5. Increase student participation.
6. Have instant appeal - colorful, attractive, and attention-getting.
7. Convey ideas with few words.
8. Timeliness.
9. Inexpensive.
10. Provide motivation.
11. Easily produced locally and quickly.
12. Gives direction to the user - accurately represents data.
13. Needs no special equipment or special environment.
14. Are permanent and can be re-used as often as needed.
15. Are available commercially over a wide range of subjects and areas.
16. Presents a mass of information in a small space.
17. Permanent pre-prepared static display.
18. Issued singlely and in sets.
19. Supplement for historian or geographer (old maps).
20. Substitute for the actual item.
21. Suitable for individual use or large or small classroom situations.
22. Large visual appeal.
23. Can be shown in any sequence and at any pace.
24. Show relative size and position.
25. Useful for display purposed, individual work centers, student reports, testing.
26. Require minimum planning prior to use.
27. Maps can be made or bought according to grade-level appropriations.
28. Can carry a single idea in a forceful way.
29. Pictorial representation.
30. Summarizes ideas presented.
31. Preserve an impression of past life and activities.
32. Shows quantitative relationships.
33. Shows arrangement and relations, as of parts to the whole, relative values, origins and developments, chronological fluctuations, distribution, etc.
34. Can intermix pictures, drawings, cartoons, diagrams and verbal materials to illustrate their ideas or highlight specific points.

Disadvantages

1. Large charts are cumbersome to carry and to store.
2. Charts and diagrams large enough to be seen by students in the back of the room are expensive to have made, and they are hard to preserve for repeated use.- easily damaged.

Disadvantages (cont.)

3. Restricted to one idea.
4. Difficult to keep certain material up-to-date.
5. Sometimes too small and too much detail for classroom use.
6. Not all symbols used are easily recognized and understood.
7. Need to bridge gap between diagrammatic symbols and reality.
8. Needs a projector for small charts.
9. Involves extra instruction and much time in preparation.
10. Do not incorporate a sound stimulus.
11. Require teacher guidance in interpretting.
12. Maps - the size relationship is not completely accurate and most maps are two-dimensional.
13. Must have a skill in reading them.
14. Require a background of experience and information to be effective teaching devices.
15. May contain too many concepts to be effective.
16. Class clown thinks it's very amusing to pull down the wrong roller map.
17. May be difficult to give a true representation of data. Graphic materials show approximate values, rather than exact information.

Points to Remember in Construction

1. Keep the chart simple and uncomplicated - avoid fancy distracting details.
2. Make clear, sharp lettering - be neat.
3. Avoid crowding the chart - leave a border space.
4. Arrange material so it is easy to read and follow.
5. Make the chart colorful, meaningful, and interesting.
6. Properly mount and possibly laminate.
7. Make the chart large enough for group instruction.
8. Sketch rough layout to size before you start.
9. Choose durable material.
10. Use accurate information.
11. Predetermine the style, size, and elements to be included on the chart in terms of its future use.
12. Use only one basic idea per chart.
13. Base ideas on interesting and challenging topics.
14. Allow class to participate in adding to the chart as the lesson progresses.
15. Use opaque projector to enlarge professionally made drawings.
16. Don't be afraid to borrow ideas from advertising posters.

Purposes

1. Give concrete representation to abstract ideas.
2. Shows sequence, shows steps in a process.
3. Promotes learning and retention of varied data and ideas.
4. Clarify complex ideas.
5. Enliven material and presentation, emphasize important points.
6. Shows locations.

Purposes (cont.)

7. Shows relationships, gives direction.
8. Preserves impressions of past life.
9. Substitute for actual item.
10. Visual display material.
11. Records expository information.
12. To clarify a confusion of printed details and to review concepts.
13. To teach understanding of symbols.
14. To offer answers and solutions - presents summaries and comparisons.
15. Use as an introduction and/or summary at the beginning/ending of a unit or class.
16. Offers statistics pictorally.
17. Graphs show numerical data so viewer can make comparisons.
18. Charts arrange facts so they can be viewed systematically.
19. Maps show relationships and what the earth, etc., look like.

Types of Charts

1. Time line
2. Stream
3. Tree
4. Pictorial chart or graph
5. Bar chart or graph
6. Circle or pie
7. Tabular
8. Rectangular
9. Vertical
10. Horizontal
11. Sequence
12. Process
13. Line drawings
14. Comparison or contrast
15. Experience
16. Flow or organization
17. Outline
18. Classification
19. Relationship
20. Chronological
21. Map
22. Diagram
23. Financial Records
24. Genealogical

FILMSTRIPS AND SLIDES

Advantages

1. May pace according to interest and attention span.
2. They are relatively inexpensive and durable.
3. Equipment is easy to set up and run.
4. Adaptable for individual, large, or small group instruction.
5. They focus the attention of the learner.
6. Available in either color or black and white.
7. They can picture objects and events that are far away in time and space.
8. Sound may be added to these medium.
9. They can show an entire class an intimate view of microscopic matter or of places not usually available for direct viewing.
10. They can bring together events from many different places or areas and show them within a few moments, for comparison.
11. They can be easily stored.
12. Slides and filmstrips are flexible and controllable.
13. Available in a wide variety of visual experiences.
14. Teacher still has control of class because of semi-dark room and projecting from back of room.
15. Magnetic appeal of the screen.
16. Can be stopped, reversed, looked at again.
17. Slides can be made of anything that is drawn, written, typewritten, printed or photographed.
18. Slides can be taken by any 35 mm camera.
19. Slides have increased usefulness with tray storage and automatic projection.
20. Can be supplemented with captions, recordings, or cassettes.
21. Can be made in-house.
22. Material arranged in sequence for showing.
23. Magnifier image for entire class to see.
24. Portable equipment.
25. Still useable parts of out-dated filmstrips can be made into slides.
26. Continuity of information.
27. Ability to update easily.
28. Usually high interest materials.
29. Easy to use without adequate preparation on the part of the teacher.

Disadvantages

1. May become outdated.
2. Do not show motion or action, but only suggest it.
3. Must be shown in dark or semi-dark room - in a darkened room, teacher has less "span of control".
4. Care in handling and filing is necessary - easily damaged.
5. Best when correlated with other materials.
6. Slides and filmstrips are not plentiful for all areas.
7. Filmstrip has a fixed sequential order.
8. Requires power source- no sound unless accompanied by a record or tape.
9. Potential for mechanical repairs.
10. Over-used - students get bored when same visual aid is used too often and poorly done.

Disadvantages (cont.)

11. Commercial filmstrips and slides may not meet teacher's objectives.
12. Slides are not available for an immediate response-time lag for development and processing.
13. Easily damaged, especially by heat and scratching, and difficult to repair.
14. Can be misplaced or lost easily.
15. Filmstrips have no good, quick way for rewinding.
16. Requires special skill and equipment for close-ups and copying.
17. Their durability may lead to neglect in updating to meet current needs.
18. Too many pictures for one class period.
19. Reprints are still life only.
20. Can be projected incorrectly.
21. Projection not as bright or sharp as that of a lantern slide.
22. Requires teacher's time in preview.
23. Difficult to produce locally.

Ways to Use the Filmstrip or Slide

1. Preview.
2. Develop a file.
3. Use carefully - don't merely show it.
4. Prepare key questions.
5. Point out title and aim of the filmstrip.
6. Do not permit long periods of silence while showing.
7. Read captions in a clear voice.
8. Call on students to explain some of the frames.
9. Use for motivation, presentation, summary, or review.
10. Develop quizzes.
11. Assign specific title for previewing by student in Instructional Resource Center or classroom.
12. Use several for learning centers.
13. Produce a tape to correlate with the slide or filmstrip presentation.
14. Introduce material or a subject.
15. Creative writing activity.
16. Encourage class discussion.
17. Independent study.
18. Develop slide/sound presentation for orientation purposes.
19. Use as an introduction to a unit.
20. Commercial slides of works of arts could be used to expand the understanding of the students in a variety of subjects.
21. The filmstrip with cassette is a good medium for storytelling in the lower elementary grades.
22. Enrich textbook material.
23. Use the projector's high intensity light for simulating the sun rising on a globe or for shadow displays.
24. Children may make slides of their own art work.
25. Use to present functions and methods of school to the public.
26. Motivate the gifted student to pursue individual endeavors.
27. Present the lesson in a different format for slow learners.
28. Motivate interest in local history and their community.

Ways to Use the Filmstrip or Slide (cont.)

29. Promote reading readiness in primary grade children.
30. Self-viewing in library or learning center.
31. Factual material can be illustrated.
32. Can be used to catch up absent students.
33. Can trace illustrations from filmstrips and slides onto paper - especially good for stage play backgrounds.
34. Can use only needed parts of the filmstrip or slides.
35. Both filmstrips and slides project a large image very well making them ideal to use with a large group.
36. A class can record special events on slides to later be used and discussed.

SUPER 8MM FILM LOOP PROJECTIONS

Advantages

1. Simple cartridge loading - no threading or rewinding necessary.
2. Easy operation for students and teachers.
3. Provides for single concept films; motion.
4. Commercial film loops available.
5. Homemade film loops can be made - magnetic striped films make local production with sound possible.
6. Offers many advantages that filmstrips and 16 mm film provide.
7. A sound tape can be added to correlate with the film loop.
8. Some machines have still picture option.
9. Small groups or individuals obtain best use.
10. Brief presentation and to the point.
11. May be used to reinforce and idea.
12. Continuous.
13. Encased in a cartridge - child proof.
14. Very motivating due to incorporation of movement.
15. Available in color.
16. Daylight projection.
17. Equipment is pre-focused and turns off automatically.
18. Requires little storage space.
19. Available in wide content area for education and entertainment.
20. Are particularly useful in describing motion, showing relationships, or giving impact to the topic.
21. Cartridge protects film from dust and handling.
22. Easy repeat showings aid learning.
23. Cyclical nature good for use with natural phenomena.
24. More portable - can be carried home for study.
25. Often includes captions for explanation.
26. Good supplement to printed materials.
27. Requires little teacher preview time.
28. An alternate information channel for poor readers.

Disadvantages

1. Most are continuous loop cartridges; cannot rewind parts of film loop.
2. Material and machines are costly in order to individualize.
3. Generally no sound.
4. Machines are usually noisy.
5. Not good for large groups.
6. Less sharpness and clarity on large screen projection.
7. Mechanical failures are possible.
8. More expensive than filmstrips.
9. Fixed rate of presentation - moves very fast.
10. Lack response capability.
11. No provision for "slow" or "reverse" on loop equipment.

MOTION PICTURES (16mm)

Advantages

1. Viewing a film is a vicarious experience.
2. Film provides realistic experiences - reality helps in memory retention.
3. Film is an attention getting device - usually very high interest materials.
4. Many films are available through various sources (to rent or borrow).
5. Film combines motion, sound, and realistic images.
6. They come in color or black and white.
7. Films bridge time and space (different times in history).
8. Slow motion is possible.
9. Film hastens the understanding of abstractions.
10. Used primarily for large group instruction.
11. Stimulates class involvement.
12. Displays photomicrography.
13. Presents factual information, explains processes, presents concepts and demonstrates skill.
14. May be instructional, documentary, newsreel, entertainment or sponsored by company.
15. Useful in explaining concepts.
16. Provides time/lapse high speed photography.
17. Provides animation.
18. Provides an easily reproduced record of an event.
19. Enlarge or reduce actual size of objects.
20. Present physical processes invisible to naked eye.
21. Influence and even change attitudes.
22. Offer a satisfying esthetic experience.
23. Good method to show lengthy documents, events, or stories.
24. Incorporates color, drama, sound, clarity, and sequence to motivate learning.
25. Can teach for several hours without teacher intervention.
26. Films don't rely on the viewer's ability to read to a large extent.

Disadvantages

1. Projectors are hard to transport.
2. The room must be dark unless rear screen projection is possible - dark room presents a span-of-control problem.
3. Films are not available for everything.
4. Some films are biased and make untrue statements.
5. Availability of equipment in some schools is limited - costly to buy.
6. It is hard for students to ask questions during the showing.
7. Mechanical breakdown is always possible - burned out lamps, sound and light focus, broken films.
8. May be thought of as a recreational activity rather than an educational activity.
9. Cannot stop to reinforce or go over missed ideas.
10. Not usually for individual use.

Disadvantages (cont.)

11. Advanced scheduling and planning is needed.
12. Become outdated.
13. Equipment is cumbersome and complicated to operate.
14. Films are relatively expensive.
15. Film may move too fast for students to grasp the information.
16. Requires power source.
17. Special materials necessary for repairs.
18. Requires teacher time to preview and create lessons.
19. Requires study guides and in-service training for proper usage.
20. To prolong life of films, they should be stored in humidity and temperature controlled rooms.
21. Present equipment may become obsolete.

To be Useful with Students Motion Pictures Should be:

1. Adaptable for the age group seeing the film.
2. As free as possible from any commercialism.
3. Fit into a normal class period with time for adequate motivation and introduciop.
4. Available on the showing date.
5. Free, except for postage and insurance.
6. A reinforcement and extension of previous knowledge.
7. Specific in its approach.
8. Directly related to what the students are studying.
9. Able to carry a message visually.
10. Meaningful and significant.
11. Able to present situations from the angle at which students would normally view them.
12. Unfolding concepts slowly enough to allow students to comprehend their full meaning.
13. Used by the teacher as an integral part of the learning experiences in which he night be involved.
14. Up-to-date and accurate in content.
15. Color and sound production must be good.
16. Equipment must be free of mechanical problems.
17. Must be and extension of what the pupil already knows and give additional information.
18. Introduced by the teacher with understanding and intelligence and have a follow-up discussion or other feedback.
19. Suitable for follow-up activities.
20. Factual, realistic, fanciful, imaginative.
21. Supplemented with appropriate materials.

Plan for Film Use

1. Order equipment and film in time for preview - study teacher's guide.
2. Show only those films which relate to class work - provide related materials - (study guides, work sheets).

Plan for Film Use (cont.)

3. Show only those films which relate to class work.
4. Prepare pupils for the film - before showing it, give students some points you expect them to learn - review special terminology.
5. Show only what you need.
6. Use the"stop-film" technique thoughtfully and wisely to recall immediately a particular point on the film.
7. Evaluate the film after use - oral evaluation or written quiz, or have students write a short summary.
8. Use a second time for clarification.
9. Provide follow-up activities and practical applications.
10. Don't use the term "movie" - students think it's for entertainment.
11. Return equipment promptly. Report any malfunctions.
12. Review the learning experience and write and after - action report to whomever it-may-concern.
13. Vocational guidance.
14. Extra curricular activities.
15. Give publicity to school activities.
16. Enriching a unit of work.
17. Explaining a process.
18. Demonstrating a skill.
19. Dramatizing an event or well-known classes.
20. Depicting life and conditions in other lands or periods of time.
21. Showing development of plant or animal life (time lapse).
22. Teaching current events - documentary film or newsreel.
23. Play only soundtrack - have students draw the picture.
24. Have students write the beginning or ending.

RECORDS AND RECORD PLAYERS

Advantages

1. A variety of recordings is available - variety of content area.
2. Recordings provide narration for slides or filmstrips.
3. Record players are easy to operate, portable.
4. Most records ar made of break-resistant material.
5. Records can be purchased from commercial producers.
6. Records are relatively inexpensive.
7. Can be pre-heard and evaluated.
8. Easily stored.
9. Can be stopped, started, and replayed at discretion of the user.
10. Can play 75, 45, and 33 1/3 records on same machine.
11. Vehicle of entertainment.
12. Can be used at home.
13. Popular.
14. Useful in language instruction.
15. Way to preserve the spoken word.
16. Sound reproduction better quality than cassettes.
17. Takes advantage of student's curiosity and natural interest in listening.
18. Can be used individually or for small and large groups (by use of speaker system or headphones).
19. Cannot be altered.
20. Outlet boxes allow for numerous jacks at once.
21. To provide works done by original author.
22. Provides source of material not able to be described.

Disadvantages

1. They appeal to the audio sense only.
2. Many students have poor listening habits - attention span is short because students are accustomed to audio-visual combination.
3. Teachers must dust the records and record player frequently.
4. Records may be broken or scratched - may warp.
5. Lack compactness - harder to store than cassettes.
6. Usually cannot be produced locally.
7. Must be stored properly - upright, away from heat.
8. Records wear out.
9. Most school record players produce very poor sound.
10. Cassettes and tape recorders are replacing records and record players in many schools.
11. Requires power source.
12. Requires detailed cataloguing to locate some selections.
13. Lack of visual stimuli.
14. Stereophonic records should not be played on a monaural record player.
15. Not easily produced locally.
16. Presentation is rigid.
17. Tends to be overused - oral renditions of all assigned readings in literature, etc.

Uses of Record Player

1. Many record players may be used as a public address system; an input and a volume control for a microphone are provided.
2. Use with listening center for individual or small group listening activities.
3. Record players are used along with slide projectors and tape recorders.
4. Provide background music for study activities.
5. Present recorded dramatizations of historical events.
6. Present recorded reviews of dramatizations for literature and poetry appreciation.
7. Music study and appreciation.
8. Independent listening.
9. Use for drill work in all subjects.
10. Creative writing and painting.
11. Storytelling.
12. To test ability to listen critically.
13. Provide script for a read-along story.
14. Sound effects.
15. Create a specific mood.
16. Language instruction.
17. Teach library skills.
18. Dancing, rhythmics, marching.
19. Speeches.
20. Pleasure listening.

MICROFORMS

Advantages

1. Thousands of documents can be duplicated at low cost.
2. Microforms can be mailed cheaply.
3. Minimal storage space is needed.
4. Microforms are readily filed and retrieved.
5. With the use of a reader-printer a print-out of any material on microform can be obtained by the student researcher.
6. Far more material can be stored by a library on microform than would be possible in original print form.
7. More permanent record of material.
8. Individual use.
9. Almost anything can be purchased on microform.
10. Very durable.
11. May get transparent or opaque stock.
12. Eliminates rebinding.
13. Archival permanence.
14. Accessibility to periodicals and newspapers that would not be purchased or stored otherwise.
15. May be read by 1-3 people at a time.
16. For research work.
17. Preserves information in rare books and out-of-print books.
18. Eliminates problem of missing pages in magazines.
19. Variety of formats.
20. Can be used in a fully lit room.
21. Very few are lost or stolen.

Disadvantages

1. Variety of types of microform, each of which demands specialized equipment for storage and use.
2. Lack of optimum physical environment for microform use.
3. If reader-printer is not available, material cannot be transported for use at home.
4. Cost of print-out from reader-printer.
5. Lack of uniform standards for microform production. (Microforms are available in 16 different formats.)
6. Not for large group instruction.
7. Printed copy of microform turns black from exposure to sunlight.
8. Lack of user acceptance.
9. Hardware cannot easily be taken out of library.
10. Need both reader and printer.
11. Need darkened area for viewing.
12. Usually must order directly from the publisher.
13. Small number of commercial houses available.
14. Difficulty in finding exact desired page.
15. Generally, the material must be read in a library (some have portable readers).
16. Complex equipment requires special maintenance.
17. Difficulty and strain in reading.
18. Microfiche cards are small and easily displaced.
19. The inherent nature of the readers tend to cause fatigue with extended use.

Suggestions for Microform use:

1. Lighting in the microfilm reading rooms should be an indirect glow and preferably no outside light should be should be admitted.
2. Equipment should be well maintained, and as newer types of equipment become available these should be purchased.
3. The reading and storage area should have temperature and humidity control.
4. Personnel should be available to assist students in using the equipment.
5. Provide easy to understand directions for use on each machine.
6. Have a comfortable, quiet, working,viewing, and reading area.
7. Provide portable readers for circulation.
8. Have film that reads black on white rather than negative film.
9. Provide easy access to microforms.
10. Have indexes to the film readily available.
11. Provide adjacent copying machine to duplicate microform onto paper.
12. Provide sufficient readers adjacent to microform storage.
13. Use to keep a complete and intact periodical collection.
14. Introduce to gifted students for research purposes.
15. Research and archival.
16. Purchase of very expensive books, rare books and out-of-print books.

OVERHEAD PROJECTOR AND TRANSPARENCIES

Advantages

1. The teacher faces the class to operate the machine.
2. Color and overlays can be used to make more effective presentations.
3. It increases student attention.
4. It can be used in lighted room to permit seat work and note taking.
5. Permanent transparencies are available.
6. Projector is lightweight and easily operated.
7. The teacher is able to maintain complete classroom control and interest in a lesson by simply turning a switch on and off.
8. The teacher can supplement transparencies with several services and techniques to further enhance interest in a lesson.
9. Written material used in the demonstration with a greased pencil on the transparency may be wiped off with a clean cloth and the transparency may be used for the next class that same day.
10. Almost anything can be copied.
11. Cellophone rolls are available.
12. Saves time compared with chalkboard presentations-can be pre-prepared.
13. Teacher can view the class and observe their reaction to the new material being presented.
14. Transparencies can be stored easily and are very durable.
15. The teacher can build a lesson or break down a lesson step by step using the overhead.
16. Can be made locally or purchased from commercial houses.
17. Good for large group instruction.
18. Alteration can be made while being projected and hence becomes a "live" illustration.
19. Machine is simple with little maintenance.
20. Short preview time required and no equipment needed.
21. Can add the effect of animation with polarized accessory.
22. Tachistoscope can also be added.
23. Can pace material to subject.
24. The operator can point out features that appear on the screen by pointing to the materials on the projector itself.
25. Encourages student participation.

Disadvantages

1. Transparencies are needed and they are expencive.
2. Initial expense is high.
3. Sometimes the teacher blocks the view of the image on screen.
4. Keystoning is possible.
5. May become habit forming procedure for teacher.
6. Static quality may sometimes be limiting for teaching purposes.
7. Machine can malfunction.
8. Hard to read from a distance if type is too small.
9. Cannot use pictures or photographs without converting them.
10. Requires a power source.
11. Extra time required in some production techniques.

Disadvantages (cont.)

12. Special equipment necessary for some preparation techniques.
13. Represents flat surfaces.
14. Durability of material may prevent updating.
15. Limited to instructional rather than research use.
16. Hard to write on at times - glare.
17. Transparencies do not cope well with half-tones or color photographs.

Uses

1. Introduction of a unit.
2. Demonstration of a technique or process.
3. Show examples of concepts.
4. Explain different materials.
5. Review materials for testing.
6. Give test to students.
7. Grade papers or tests.
8. Use as a chalkboard substitute - saves time.
9. Use the disclosure method of showing portions one at a time - in progression.
10. Useful as statistical graphs, experiments, science charts, anatomical drawings, 3-dimensional objects.
11. Project other visual aids simultaneously with transparency.
12. Use progressive disclosure of the transparency as a teaching technique.
13. Provide scenery for storytelling.
14. Replace flashcards.
15. Project charts and diagrams too small to be seen by entire class.
16. Enlarge maps.
17. Polarization (simulated motion-movement technique).
18. Allows use of silhouettes.
19. Letter writing models, shorthand exercises or bookkeeping forms for business education classes.
20. Music staff for addition of notes or for audience to follow.
21. Scale drawings.
22. Demonstrate use of plastic items (protractors, drafting triangle, toy gear sets, etc.).
23. Produce a visible magnetic field - put magnet on acetate sheet and sprinkle iron filings on it.
24. Hang bedsheet on frame and project scenery transparency through back of sheet.

OPAQUE PROJECTOR

Advantages

1. Material may be from many sources - scope of material limitless.
2. No special processes are needed.
3. Flat, three-dimensional objects can be projected.
4. Reproduces color.
5. Operating cost is low.
6. All the students can see at the same moment a picture which might be too small to view if the teacher had to hold it up in front of the class or post it on a bulletin board.
7. Shows materials in its normal state without alterations.
8. Enlarges any still picture.
9. No need to remove page to show - no transparency preparation is needed.
10. Can show representation of material from hard copy.
11. Equipment is simple to set up and operate.
12. Teacher is in front of class facing students.
13. Replacement for an inadequate blackboard.
14. Adaptable to any size group.
15. A continuous roll of acetate can be used for certain subjects.
16. Overlays can be made to show sequences in a process or operation.
17. Immediate availability of image - does not need to be converted into another format.
18. Will project images of materials as large as 10" by 10" in size.

Disadvantages

1. The room must be dark for showing.- less teacher control of class.
2. The machine is very heavy and awkward to handle.
3. The machine requires strong illumination. (high intensity power lamp)
4. The image on the screen is less bright than it would be if the picture were on a transparent slide.
5. Equipment may not be readily available to teacher.
6. Excessive heat to original work being projected.
7. Machine can malfunction.
8. Projection depends on the ability of object to reflect light.
9. Has no sound element.
10. Requires power source.
11. Equipment may be expensive.
12. Noisy to operate.
13. Equipment can pose a storage problem.
14. Projectors must be placed as close to the screen as possible which may necissitate a change in the seating arrangements.

Uses

1. Opaque projectors can project onto a screen any nontransparent picture including photographs, illustrations, handwritten materials, maps, charts, and sketches. These materials may be mounted or unmounted or bound into a book or magazine.

Uses (cont.)

2. Display fragile items such as old documents.
3. Enlarge materials for tracing and displays.
4. Good for large group presentations.
5. Instruction on filling in forms, writing checks, etc.
6. Critique sentence structure as a group.
7. To share single copy of a book with an entire class.
8. Project pictures to save time in mural or scenery making by sketching in outline and filling in color later.
9. Project coins or other shallow realia.
10. Postcard travel presentation.
11. To show chemical reactions.
12. To show comparison.
13. For dissection.
14. To show individual examples of work to class and to examine errors.
15. To project magazine or book pictures during student presentation.

TAPE RECORDERS

Advantages

1. Versatile.
2. Inexpensive.
3. Easily transported.
4. Simple to operate.
5. Easily edited.
6. Easy to store tapes and ship them.
7. Usable time and time again (erasing and rerecording).
8. Capable of recording a great amount of material.
9. Made by experts.
10. Saves time (pre-taping).
11. Can be played over and over by slow learner.
12. Able to listen while doing.
13. Earphones, if used, shut out outside noises.
14. Material can be used over many times.
15. Material may be obtained from numerous sources such as radio, records, television.
16. Can easily be produced locally.
17. Cannot be scratched or warped like records - durable.
18. Cassettes enable materials to be more portable and eliminates the need for threading.
19. Simplicity in loaning.
20. Can be operated anywhere by battery.
21. Cassette is an international standard.
22. Most students are familiar with tape recorders through home use.
23. Ability to stop, play back, control volume, and tone.
24. May be used in conjunction with projection equipment, to provide sound and/or control presentations of slide series and filmstrips.
25. Students enjoy operating tape recorders which aids in stimulating the learning experiences.
26. May easily be reproduced.
27. Easily repaired.
28. Adapts well to individual and group use.
29. Instant recording and storage of special events and provides immediate playback.

Disadvantages or Limitations

1. Complicated to operate (reel to reel).
2. Applies only to audio senses.
3. Tapes may be accidentally erased and sometimes become tangled.
4. Storage area needs to be cool, dry, and away from magnetic field.
5. Difficult to start in the middle.
6. Slightly more expensive than records.
7. Cassettes are hard to mend if broken.
8. Recording on cassettes are not as clear as records.
9. Good machines may disappear.
10. Low retention, one fourth of what a person hears, he remembers.
11. Students may not actively listen.

Disadvantages or Limitations (cont.)

12. Extraneous noises may interrupt the class'concentration.
13. Some rooms have poor accoustics.
14. Equipment is expensive to purchase and to maintain.
15. Longer tapes are thinner and jam more quickly.
16. Requires much teacher preview time.
17. Requires power source.
18. Recordings can become lengthy verbal lectures.
19. "Print through" can occur if not played frequently.
20. Can become entertainment.

Uses

1. Interviews.
2. Radio programs.
3. Speeches outside of the room.
4. Skits presented in the room.
5. Speeches presented in the room.
6. Reports given in class.
7. Introduce a topic or unit or give additional information.
8. Give instructional material.
9. Project activities of students.
10. Music appreciation.
11. Drills.
12. Public speaking.
13. Hear original work of an author.
14. Record a lesson to be usdd later.
15. Record student debate.
16. Talking book for the blind.
17. Sound effects.
18. Automatic synchronization with film medium.
19. To acquaint band or orchestra with a new piece of music.
20. To prepare a dictation lesson at a set speed.
21. Self-evaluation for speech skills.
22. Can present lesson to absent student.
23. Use in learning centers to administer instruction for non-reading students.
24. Ideas and comments of community resource people.
25. Permits delayed use of sound.
26. Permits editing.

TELEVISION

Advantages

1. Each student has a front row seat.
2. According to recent studies, students learn as much from television as those taught in conventional classrooms.
3. Television brings the opportunity to use many sources of audio-visual materials to provide richer learning experiences - expands the curriculum.
4. Form of self-evaluation for teachers and students.
5. Review or refresher courses can be offered in many areas.
6. Television brings the master teacher to more students.
7. It is a time saver for the teacher.
8. Television makes it possible to teach content which may be too recent for inclusion in current textbooks.
9. It is a valuable in-service training for teachers.
10. It helps students acquire good listening and viewing habits.
11. It increases interest and motivation.
12. It makes the teacher's presence more necessary.
13. It adds dimension to learning.
14. Can teach more students simultaniously.
15. Provides instant news and communications.
16. Effective at all grade levels.
17. Covers a broad scope of materials and content.
18. Usually well organized presentations.
19. Convenient and economical.
20. Increase vocabularies.
21. Encourages further reading.
22. Helps student understand his environment.
23. Global communication.
24. Classes for credit.
25. Additional resources for the gifted.
26. Small cameras give versatility for teacher and student production of films with almost instant feedback.
27. Experiments can be performed that might be potentially dangerous in the classroom.
28. Minimum light-control allows for notetaking.
29. Lends itself to discussion.
30. It demands neither high verbal proficiency nor physical presence at the scene of action.

Disadvantages

1. High cost.
2. Difficulty in scheduling programs.
3. Students do not have the opportunity to ask questions.
4. There is very little contact with the television teacher.
5. It curtails the initiative and creativity of the classroom teacher.
6. It is based primarily on the lecture method.
7. There is little flexibility in timing.

Disadvantages (cont.)

8. The physical features of the room need to be planned.
9. No feedback for teacher.
10. Often used as a crutch by an ill-prepared classroom teacher.
11. Unable to catch missed ideas.
12. Show can be bias.
13. Technical difficulties of production and transmission.
14. Small screen makes it difficult to use with large groups.
15. Danger of reducing students to passive, dreamlike identification with what is often called entertainment.
16. Geographic area reception limitations.
17. Bulky equipment.
18. Involves much time in local production.
19. Often limited to black and white.
20. No preview.
21. Commercial television may inflict emotional or physical harm.

For Television Teachers:

1. Scripts must be planned to include camera shots, closeups, visual aids, etc. The camera must move to the proper shot without any hesitation. Timing element essential. Things which the teacher might handle in the classroom are beyond his control in the studio.
2. The teacher uses no prepared lectures. The teacher works from notes to appear more natural - must be well paced.
3. Chalkboards, revolving tables, table easels, split screens, and blow-ups are used to emphasize procedures and explanations.
4. Teachers should maintain a pleasant manner and speak distinctly if they want to keep the audience from flipping the dial - shy away from monotone.
5. The teacher should deal with only a few topics and cover them well.
6. Think ahead for questions that might be asked and answer them (allow for reaction time).
7. Produce manuals for both student and teacher to use during lesson.
8. Plan follow-up activities.
9. Beware of colors and which have the same shade of gray on the black and white TV's.
10. Be aware of what you are wearing so that it does not detract from the teaching points that you want to make. Check out other mannerisms that may draw too much attention (unnecessary hand movements).
11. Schedule a rehearsal time.
12. Establish eye contact with TV audience.
13. Make enough scripts for cameramen and console operator.
14. The classroom teacher is the key - she/he must advise, interpret, coordinate, utilize, guide, follow-up to help students apply the TV lesson.
15. Cooperation of a team of classroom teachers, studio teachers, TV technicians, media specialists and television producers is essential.
16. Should be thought of as an important supplementary learning experience, not used as the central or only experience in a subject area.

STILL CAMERAS
(Box or 35mm)

Advantages

1. They are cheap and simple to operate - a box camera can be used.
2. The film does not run continuously through the camera; consideration can therefore be given to individual shots, angle and composition.
3. The image is frozen, offering opportunity for prolonged discussion and analysis of the shots taken.
4. The production of a series of stills (prints or slides) that relate a story sets a goal easily attainable in a limited period of time.
5. Prints or slides can give a total view of events as they take place over a period of time.
6. Generally simple or more sophisticated productions can be developed.
7. Can be produced locally.
8. No other equipment needed to view after processing.
9. Almost everyone has one and knows something about its operation - requires minimal skill.
10. Can be used out-of-doors or indoors with flash.
11. Is an action activity that appeals to students.
12. Can use black and white or color film.
13. Easy to store.
14. Flexible and adaptable to any subject area.
15. No power source needed.
16. Stops fast action.
17. Focus up close.
18. Anyone can participate.
19. Produces sharp enlargements.
20. Can be a motivational tool.

Disadvantages

1. Budget may require limited use.
2. Better cameras are expensive.
3. Limited to those who have cameras.
4. Shots and film may be ruined or damaged.
5. Provide no motion.
6. Has continuing costs of film and processing.
7. Limited to two dimensions.
8. Lapse of time between picture taking and development.
9. Must plan ahead if one wants pictures for a certain occasion.
10. Difficult to show sequence.
11. Special equipment is needed for close range shots.
12. Need professional skill in repair.
13. Students may not respect equipment.
14. Size of print originally determined by size of film used.

Uses

Applications of the Camera in the classroom

1. Interviews - Interview someone; take pictures to enhance the story (both portraits and action could be used).
2. Story Illustrations - Take pictures to illustrate stories that have been

Uses (cont.)

2. (cont.) written about people, the school, the neighborhood, civil rights, etc.
3. Scrapbooks - Arrange pictures around certain themes or interests that can be put in a scrapbook. Look for shots that will tell the story about them; for example, building model airplanes, camping, construction of a new building.
4. Maps - Make large maps of the community of mural paper. Take snapshots of various buildings and places. Place them where they belong on the map.
5. Vocabulary Development - Improve vocabulary by taking pictures to illustrate words; for example, darkness, peaceful, growing, subtle, arrogant, loneliness, etc. Make individual booklets and arrange classroom displays.
6. Speed/Motion/Time - Take pictures to show different stages and cycles of plant growth.
7. Sequence/Order/Logical Groups - Construct a story by arranging pictures you have taken into logical order.
8. News and Current Events - This activity has much intrinsic merit in helping children record their reactions to their immediate environment; for example, the new paint job, the School Project Night, a new pet in the classroom, a visitor to the school.
9. Trips - A series of slides of the sequence of a field trip can be constructed into a type of movie. Small groups can write about each slide and later put their narration onto tape to share with another class.
10. Photo-Biography - Take pictures to show the life of someone -- a relative, teacher, sports figure, etc. (It could include work, family, play, etc.).
11. Contest for best pictures of a certain subject.
12. Slide productions.
13. Displays/Archives.
14. Teach library skills.
15. Pictures can teach enumeration, description, and interpretation of the photographed subject.
16. Pictures can arouse interest, stimulate discussion or raise questions in any subject area.

COPY MACHINE

The "Secretary" Copier machine is located in most schools.
It has several important functions:

1. Makes spirit masters for liquid duplicating.
2. Makes single copies from black and white originals. (Must have carbon base.)
3. Makes transparencies.
4. Laminates papers.
5. Archival use.

Advantages

1. It is easy to operate and requires a minimum of maintenance when used properly.
2. It is very flexible, as indicated by its several functions.
3. Relatively inexpensive.
4. Provides multiple copies quickly.
5. Provides copies of materials that do not circulate.
6. Provides students with unavailable copies of needed materials.
7. Can replace lost pages of books and periodicals.
8. Eliminates the need for extensive retyping of material.
9. Local production.
10. Good reproduction.
11. Make duplicate copies: Xerox machine for single copies.
    Spirit Duplicator for 15-100 copies.
    Mimeograph machine for 100-5000 copies.
12. One machine can serve a great number of people.
13. Leasing agreements available to determine actual quality and usability prior to purchase.
14. Can provide proof by the printed copy - example: a cancelled check.
15. Saves teacher time in preparing duplication masters.

Disadvantages

1. Need carbon - based ink to copy.
2. Color does not copy.
3. Ink is messy (on ditto and stencils).
4. Requires care in making stencils.
5. Skill required in operating machine.
6. They all require costly, special equipment.

Functions

Contact photocopier - will make a copy from anything printed, drawn, written or typed in any color ink, pencil, or crayon on any color paper, but the copy will be in shades of black and white. Information can be omitted, added or changed before making copies by placing another paper over that area. Can copy material onto a transparency. Can produce single copy from a bound original such as a book or periodical.

Gelaton hectograph - will produce many copies from one master which can be saved and reused. It allows for several colors at one time. It is somewhat outdated, but is very cheap and can even be homemade.

Functions (cont.)

Microform copy machine - will make a hard copy for the user so that he need not sit at a machine to read the microform.

Offset duplicator - will reproduce on all weights and types of paper. It can make a second master from the first. It also enables one to make photographic reproductions of the same, enlarged or reduced size.

Relief duplicator - will imprint, perforate or score.

Spirit duplicators - will make a large number of copies from one master. It is good for anything written, typed or sketched. It does not allow for multiple colors, but is relatively cheap.

Stencil duplicator - will make many copies from one master. Colors can be quickly changed and multiple-colored copies by rerunning them through the machine.

Thermfax - will duplicate much like a photocopier or make masters which can then be run off on a spirit duplicator. Can also laminate items.

VIDEOTAPE RECORDER

Advantages

1. Appeals to visual and auditory senses.
2. Offers unique features of TV to provide educational opportunities.
3. Offers capability to produce quality-controlled presentations.
4. Prerecorded tapes can be shared and shown many times.
5. Opportunity for student to discover a new method of self-expression.
6. Opportunity for teachers to better communicate to students new information and ideas.
7. Offers improved communication within the educational community.
8. Stimulates interest.
9. Facilitates local production.
10. Saves time by prerecording.
11. May tape TV programs and use later when needed or convenient.
12. Tape can be played back immediately, can be slowed or stopped.
13. Can play on any TV screen.
14. Can convert videotape to a 16mm film for permanent use.
15. Commercial production of equipment for home use now available.
16. Simplicity of operation and storage.
17. Lower cost than purchasing a print of the program or movie - videotapes may be gotten on free loan.
18. Entire school can view at once with TV in each room.
19. Conducive to large group instruction.

Disadvantages

1. Requires training to operate.
2. Requires regular special maintenance (clean tape heads).
3. Sometimes difficult to diagnose problems during recording or playback.
4. Careless use or misuse of equipment can cause long wait until repairs can be completed.
5. Equipment is expensive.
6. Equipment is cumbersome to handle and transport.
7. Takes time to tape programs.
8. Must have both player and recorder.
9. According to copyright laws, programs must be erased after 7 days - copyright laws prohibit taping of many programs.
10. Tapes can be accidentally erased.
11. No uniformity in tape size.
12. Picture quality often inferior to film presentation.
13. Size of projection is limited.
14. Most units are black and white.
15. Lacks standardization of format.

Uses

1. Reading Class - Shows audio and video progress of student in Reading.

Uses (cont.)

2. Book Reports - Students could establish a situation in which they were to sell their book to a TV audience. They could use puppets, models, dramatizations, art projects, readings, ets., to aid them.
3. Performances - Any dramatization, puppet show, musical performance or play could be taped for evaluation of the students' projection, expression, and stage presence. Many students and teachers are "hams" -- like to up in front of the camera.
4. Science Experiments - Unique science experiments could be taped and shared with other grades which might be studying or interested in that particular concept. Zooming closeups of certain experiments are advantageous.
5. Role Playing - As an aid in building the self-concept and improving classroom behavior, you might consider videotaping open-ended role playing situations.
6. Panel Discussions and Debates - The playback of any discussion or debate can help to improve discussion skills and logical thinking as you help the students evaluate their performance.
7. Talks on Students' Hobbies - Taped talks help students analyze their public speaking ability.
8. Demonstration of Class Projects and Models to be Constructed - Taped demonstrations increase the attention of the students and help them to concentrate.
9. TV Unit Production - Fifth or sixth level students could produce a television program after study and research into television production.
10. Videotape TV Programs for future use - Advance written permission to tape a TV program is normally required.
11. Flexible Organizational Plans such as team teaching, the Open Classroom, interest groupings, and special interest teaching.
12. Self-evaluation.
13. To film sports activities.
14. Closed circuit television.
15. Use in combination with other media.
16. Record TV's great moments in history.
17. Could be used to produce information for career counseling about local businesses and industries.
18. Could be used in making an orientation program for the use of the library or any other school programs.

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